

and coördinate experiences of the staff of the Rancho Santa Ana Botanic Garden of native California plants (formerly located at Santa Ana, now at Claremont, California) into one handy volume for the interested public. It presents a large amount of information in readily accessible, clearly organized form and is enhanced by excellent illustrations.—HELEN-MAR WHEELER, Department of Botany, University of California, Berkeley.

*Plant Classification.* By LYMAN BENSON. xiv + 688 pp., 399 illustrs. 1957. D. C. Heath and Company, Boston. \$9.00.

This is a notably handsome book. The nearly 400 illustrations, including serviceable diagrammatic sketches by the author, beautifully conceived and executed analytical representations of plant families by the talented late Jerome D. Laudermilk, and well chosen photographs of natural vegetation, occupy approximately as much space as the text.

The bulk of the text (more than 300 pages) is devoted to a systematic treatment of the vascular plants—dicotyledons, monocotyledons, gymnosperms, and pteridophytes, in that order. All 80 orders of living vascular plants recognized here are keyed, as are the 332 families accepted. Chief emphasis is placed upon dicotyledons, for which the author has perfected a new five-fold system stated to be based upon "relationships" but not "purported phylogeny." The principal groups are Thalamiflorae, Corolliflorae, Calyciflorae, Ovariflorae, and Amentiferae; "the Amentiferae appear to be mostly an artificial group, and they are retained as a unit because their relationships still are not settled . . . the other four are more natural than artificial." The author believes that students should build their understanding of plant relationships around a concept of how close, or how far removed, the plant in question is from the Ranales. His groupings are designed to facilitate the development of such a concept.

Each synopsis of a class of plants appears under the heading, "The Process of Identification"; it is preceded by one or more chapters entitled, "The Vocabulary Describing . . . Characteristics," which is an illustrated résumé of the gross morphology of the particular group. This feature is strikingly reminiscent of Gray's classical "Lessons in Botany," and gives especial appropriateness to the beautiful photograph of "the father of North American botany," clad in field clothes, which serves as frontispiece.

After the encyclopaedic description of each class, there follows one or more chapters on "The Basis of Classification," which comprise a rather mixed assortment. Under angiosperms there is a chapter on "Evolution," consisting largely of a formal justification of the theory, and there is also a short section on "The Development of New Taxa"—by differentiation and isolation. Further chapters discuss "Some Fundamental Problems of Plant Classification" (method of segregating taxa, relative stability of characters), a sketch of the history of plant-classification systems, a comparison of the more recent schemes, and an exposition of the bases of the system adopted by the author.

This last chapter, summarizing the work of I. W. Bailey and his associates and students as evidence for the primitiveness of Ranales, is very promising, but its effect is considerably subdued by its relegation to pages 475 to 486. Moreover, the retention of the undoubtedly artificial and reduced "Amentiferae" as a group and of such features as a wholly artificial arrangement of fruits (based upon "fleshy" vs. "dry") and of the term "pistil," which is difficult to homologize with the evolutionary modification of megasporophylls into carpels, as discussed elsewhere in the volume, further diminish the impact.

The living gymnosperms are divided among four classes: Conopsida, Ephedropsida, Gnetopsida, and Cycadopsida. Their classification, apparently based upon a résumé of their presumed geological history, contains no reference to the work of either Sahní or that of Florin. The pteridophytes are treated similarly.

The last section deals with the "Association of Species in Natural Vegetation," and gives a descriptive sketch of North American plants under nine "floras" and a short though useful bibliography. In the middle of the book is a rather detached chapter on "Preparation and Preservation of Plant Specimens." The appendix includes a guide to favorable collecting seasons in different parts of the continent and a useful glossary.

The volume, despite its many excellent features, is difficult to sum up. The stressing of keys, identification, groupings, taxonomic hierarchy, descriptions, and collection of specimens definitely places emphasis on the *materials* of taxonomy. The arrangement of major groups, despite the chapter on evolution and that on the basis for the author's preferred system, suggests that convenience takes priority over the operations of those biological phenomena which make patterns of diversity inevitable and classification feasible. The book is designed as an elementary text for college students "*without prerequisite*," and is based on the view that the path to an appreciation of the world of plants lies primarily through learning their names and positions.—LINCOLN CONSTANCE, Department of Botany, University of California, Berkeley.

*The Mushroom Hunter's Field Guide.* By ALEXANDER H. SMITH. 197 pp., 1 figure, 124 photographs. 1958. University of Michigan Press, Ann Arbor. \$4.95.

In his introduction, Dr. Smith states that since he is concerned with mushrooms most easily identified by their pictures, illustrations are the backbone of this handbook; for each species illustrated, he includes a discussion of the important field characters rather than a formal description of the species characters. In making this book a field guide, he adds that he has sacrificed scientific accuracy, but he has pointed out in the text where it can be attained. His intention has been to illustrate the mushrooms in such a way as to enable accurate recognition and emphasize the critical characters.

In my opinion, Dr. Smith has achieved his purpose—that is, to write a field guide that would enable mushroom hunters to make accurate identifications and protect them against serious errors—more completely than one could have expected in a book of this size and simplicity. No knowledge of botany is required in order to use this guide; all that is necessary is careful observation and caution in collecting, as well as compliance with Dr. Smith's recommendations to discard all specimens that do not completely fit the descriptions and to exercise care in cooking and eating. This is a handbook that can be recommended without any hesitation and without cautionary advice to the amateur collector, since the author enumerates clearly all the dangers involved in the gathering of mushrooms for the table. The book is a good size and shape for use in the field. The photographs are excellent.

The book is intended for the Great Lakes region, northeastern United States and western United States. It includes a list of fifteen species considered safe for beginners, a list of species associated with certain trees, and a seasonal list of common mushrooms. Although only about one in thirty species in the United States is included, most of the common mushrooms, the finest of the edible species, and the most dangerous of the poisonous species are discussed and illustrated. In addition, the guide includes some of the mushrooms that are poisonous only to certain people. The introductory section includes a brief account of the role of fungi in the breakdown of organic substances, their manner of growth, nutritional and moisture requirements, and mycorrhizal relationships. The structure of fleshy fungi is also discussed, as well as variation in form, precautions to take in collecting, and the nature of Latin binomial names. Instructions are given in the use of the simplified key; a glossary and a short bibliography are also included.—ISABELLE I. TAVARES, Department of Botany, University of California, Berkeley.